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DATE: April 24, 2012

TO: Kelley Chase, EPA Region 3 OSC
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THROUGH:
Ex. 4 - CBI

FROM: Ex. 4 - CBI

SUBJECT: VERIFICATION/COMPLETENESS CHECK – DIMOCK, PA LABORATORY DATA
               File NAREL 1100245-GAMMA.pdf
               File NAREL 1100245-Th.pdf
               File NAREL 1100245-U.pdf
               File NAREL 1100245-Ra228.pdf

INTRODUCTION

On April 16 to 17, 2012, a review of the case narratives and corresponding certificates of analysis from the U.S. EPA National Air and Radiation Environmental Laboratory (NAREL Reports Posted April 5) was conducted at the SERAS facility in accordance with the Follow-Up Verification/Completeness Check agreed upon during our teleconference on Wednesday 2/8/12.

The assumptions for this review include the following: 1) Case narratives from the EPA and Regional labs and/or subcontract labs have been reviewed in accordance with EPA, Regional or Environmental Services Assessment Team (ESAT) protocols and contain all pertinent and complete information to conduct the completeness check.   SERAS will base this review on the information provided by the laboratory and not on an actual data package; and 2) SERAS will relay any "red" flags to the EPA R3 personnel to resolve and determine data usability.

OBSERVATIONS

In accordance with Table 1 – Field and QC Sampling Summary (Rev01 - 2/3/12), Table 2 – Sample Analytical Requirements Summary (Rev01 – 2/3/12), Methods for Groundwater and Surface Water, NAREL AM/SOP-3 Standard Operating Procedure for Gamma-Ray Spectrometry, NAREL AM/SOP-1 Actinides in Environmental Matrices by Extraction Chromatography and NAREL AM/SOP-13 Standard Operating Procedure for Measuring Radium-228 in Environmental Matrices and the validation guidelines developed by SERAS for radiochemical data (using critical value of 1.65), the following observations were noted and need to be clarified/resolved.

General Comments: Gamma, U and Th Analysis:
1. Raw data were not provided; therefore, it is assumed that all sample, method blank and QC results (LCS, Duplicates) were correctly transferred to the analytical result tables.
2. No equipment blanks were analyzed with this sampling batch. No qualifications could be made based on equipment blank contamination.

File NAREL 1100245-GAMMA.pdf
1. The sample result is greater than the 2σ uncertainty but less than the MDC and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following results should be qualified "UJ":Bi214 for sample FB09; Tl208 for sample HW42; and U235 for sample HW46-P.

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2. The absolute value of the sample was less than the 2σ uncertainty. The following results should be qualified as non-detect "U": Th234 for sample HW34-A; Ra228 for sample HW41-P; U235 for samples HW41-P and HW40-P; and Bi212 for sample HW39.
3. The absolute value of the sample was less than the 2σ uncertainty and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following results should be qualified as "UJ": Ra226 for samples FB09, HW42z, HW42, HW46, HW46-P, FB08, HW28A-P, HW40, HW40-P, HW39-P, FB10, HW09, HW09-P and HW28B-P; Th234 for samples FB09, HW42z, HW42, HW46, HW46-P, FB08, HW34A-P, HW41, HW41-P, HW28A, HW28A-P, HW40, HW40-P, HW39, HW39-P, HW09-P and HW28B-P; U235 for samples FB09, HW42z, HW42, HW46, FB08, HW-34-A, HW34A-P, HW28A-P, HW40, HW39-P, HW09-P and HW28B-P; K40 for samples HW42z, HW42, HW34-A, HW41, HW41-P, HW40, FB10 and HW28B-P; Ra228 for samples HW42z, HW42, HW34-A, HW34A-P, HW40 and HW09-P; and Bi212 for samples HW28A-P, HW39-P and FB10.
4. The sample result was less than the 2σ uncertainty and the MDC. The following results should be qualified non-detect "U": Bi212 for samples FB09, HW42z, HW42, HW46, HW46-P, FB08, HW34-A, HW34A-P, HW41, HW28A, HW40, HW40-P, HW09, HW09-P and HW28B-P; Ra226 for samples HW46, HW34-A, HW34A-P, HW41, HW41-P and HW28A; Ra228 for samples:HW46, HW46-P, HW40-P, HW39, FB10 and HW09; and U235 for samples HW41, HW28A and HW09.
5. The sample result was less than the 2σ uncertainty and the MDC and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following results should be qualified "UJ": K40 for samples FB09, HW46, HW46-P, FB08, HW34A-P, HW28A, HW28A-P, HW40-P, HW39, HW39-P, HW09 and HW09-P; PB214 for samples FB09 and FB10; Ra228 for samples FB09, FB08, HW41, HW28A, HW28A-P, HW39-P and HW28B-P; Tl208 for samples FB09 and HW39; Bi212 for sample HW41-P; Ra226 for sample HW39; U235 for samples HW39 and FB10; Bi214 for sample FB10; and Th234 for samples FB10 and HW09.
6. The following sample results failed the NAD criteria based on the method blank or corresponding field blank: Bi214 for samples FB08, HW34A-P and HW39-P and Pb214 for samples FB08, HW34A-P, HW39-P and HW09-P should be qualified estimated "J"
7. It is assumed that all required instrument/system criteria were met by the laboratory or had no impact on the data.

File NAREL 1100245-Th.pdf
1. The sample result is greater than the 2σ uncertainty but less than the MDC and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following result should be qualified non-detect "UJ": Th228 for sample HW39-P.
2. The absolute value of the sample was less than the 2σ uncertainty. The following results should be qualified as non-detect "U": Th232 for samples FB09, HW46, FB08, HW34A, HW34A-P, HW40-P, HW39P and HW09-P; Th227 for samples HW46, HW34A, HW41-P, HW28A-P and HW28B-P; Th230 for samples HW46 and HW09; and Th228 for sample HW40-P.
3. The sample result was less than the 2σ uncertainty and the MDC. The following results should be qualified non-detect"U": Th230 for samples HW42z, HW28A-P and HW40; Th232 for samples HW42z, HW46-P, HW41-P, HW28A, HW40, HW39 and HW09; Th227 for samples HW46-P, HW34A-P, HW41 and HW40; and Th228 for samples HW34A-P, HW41, HW40 and HW09.
4. The sample result was less than the 2σ uncertainty and the MDC and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following results should be qualified "UJ": Th228 for samples: FB09, HW42z, HW42, HW46, HW46-P, HW41-P, HW28A, HW28A-P, HW39, FB10, HW09-P and HW28B-P, Th230 for samples: FB09, HW46-P, FB08, HW34A-P, HW41, HW41-P, HW28A, HW40-P, HW39, HW39P, FB10, HW09-P and HW28B-P; Th227 for samples HW42 and HW09; and Th232 for samples HW42 and HW41.
5. The following sample results failed the NAD criteria based on the method blank or corresponding field blank. Th227 for samples FB09, HW42z, FB08, HW28A, HW40-P, HW39, HW39P, FB10 and HW09-P; Th228 for sample HW34A; and Th232 for samples HW28A-P and HW28B-P should be qualified estimated "J".
6. It is assumed that all required instrument/system criteria were met by the laboratory or had no impact on the data.

<u>File NAREL 1100245-U.pdf</u>

1. The sample result is greater than the 2σ uncertainty but less than the MDC and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following result should be qualified non-detect "UJ": U238 for sample HW42z; and U234 for samples HW34A, HW28A-P and HW09.
2. The absolute value of the sample was less than the 2σ uncertainty. The following results should be qualified as non-detect "U": U238 for samples FB09, HW42 and FB10; and U235 for samples HW46, HW39, HW39-P and FB10.
3. The sample result is greater than the MDC but less than the 2σ uncertainty and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following result should be qualified non-detect "UJ": U238 for sample HW40-P.
4. The sample result was less than the 2σ uncertainty and the MDC. The following results should be qualified non-detect "U": U234 for sample: FB09 and U235 for sample: HW28B-P.
5. The sample result was less than the 2σ uncertainty and the MDC and the uncertainty multiplied by 1.65 is greater than the MDC indicating that the MDC may be reported too low. The following results should be qualified non-detect "UJ": U235 for samples FB09, HW42z, HW42, HW46-P, FB08, HW34A-P, HW41-P, HW28A, HW28A-P, HW40, HW40-P and HW09-P; U234 for samples HW42z, HW42, HW46-P, HW28A, FB10, HW09-P and HW28B-P; and U238 for samples HW46, HW46-P, FB08, HW34A, HW28A, HW28A-P, HW09, HW09-P and HW28B-P.
6. The following sample results failed the NAD criteria based on the corresponding field blanks. U234 for samples HW34A-P, HW39 and HW39-P; U238 for samples HW39 and HW39-P; and U235 for sample HW09 should be qualified estimated "J".
7. It is assumed that all required instrument/system criteria were met by the laboratory or had no impact on the data.

<u>File NAREL 1100245-Ra228.pdf</u>

1. For Radium-228 analysis, the sample result was less than the MDC and the 2σ uncertainty and the uncertainty multiplied by 1.65 is less than the MDC. Samples HW42z HW42, HW46, HW46-P and HW41-P should be qualified non-detect "U" in the result qualifier column.
2. For Radium-228 analysis, the absolute value of the result was less than the 2σ uncertainty and the uncertainty multiplied by 1.65 was less than the MDC. Sample FB09, HW41, HW28a, HW28a-P, HW40-P, FB10, HW09-P and HW28b-P should be qualified non-detect "U" in the result qualifier column in Scribe.
3. For Radium-228 analysis, the sample result was less than the MDC and the 2σ uncertainty and the uncertainty multiplied by 1.65 is equal to or greater than the MDC. Samples FB08, HW34a-P, HW40 and HW09 should be qualified "UJ" in the result qualifier column in Scribe.
4. It is assumed that all required instrument/system criteria were met by the laboratory or had no impact on the data.
5. No qualifiers should be applied to samples HW34a, HW39 and HW39-P.

cc: ⌐Ex. 4 - CBI⌐, SERAS Project Officer
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